Deepwater Exploration with 2-D Seismic Layouts Most Likely to Achieve Economic Benefit

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Under-explored regions such as deepwater Southeast Asia require 2-D seismic as a stepping stone to 3-D seismic and drilling. The 2-D programme can be a grid, oriented with respect to known tectonic trends and designed to sample for features of a presumed minimum economic size. Additional lines will tie significant exploration wells. Such surveys barely leverage the vast knowledge of structure, stratigraphy and sediment thickness already available, minimizing the economic benefit of the work. Our work uses a regional geologic evaluation tool called SEAMAGIC to design and assist the interpretation of two hypothetical surveys.

Because the tool includes calculated sediment thickness with local qualitative illustrations, lines can be placed in regions with adequate burial for source maturation and over anomalies with sufficient top seal. The inclusion of local features of interest (wells, seeps, sample points, navigation hazards) with regional structure (fan-prone areas, basin & sub-basin outlines, fault locations, plate and terrane boundaries, accretionary prisms) permits lines to be placed to avoid problems and tie features of interest. Use of modern regional gravity and topography/ bathymetry data allows detailed correlations between seismic profiles, reducing the line density required for adequate sampling.

Beyond line placement in locations most likely to succeed with the minimal kilometrage for sampling, benefits include speed of programme design and layout; and file accessibility by seismic interpretation software. We discuss examples from the "Tripartite" area offshore Palawan, The Philippines; and in deepwater Sarawak, offshore Northwest Borneo.